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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,976	06/30/2000	Douglas P. Brown	NCRC-0012-US(9020)	1448

26890 7590 10/17/2003

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EXAMINER	
CHEN, TE Y	

ART UNIT	PAPER NUMBER
2171	

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/608,976	Brown et al.
Examiner	**Art Unit**
Susan Chen	2171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Jul 28, 2003*

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-27 and 29-41* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideratio

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-27 and 29-41* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examine

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Response to Amendment

This is in response to amendment filed on 07/28/2003 (paper # 13).

Claims 1-27 and 29-41 are pending for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 9-22, 30, 31 and 34-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hallmark et al. (U.S 5857180) in view of MacLeod et al. (6434545) (MacLeod).

Regarding claims 1 and 30, Hallmark: A method and an article of presenting an execution plan for a query, comprising:

determining steps of the query execution plan in a parallel database system (see Abstract, lines 1-19; col. 8, lines 64 to col. 9, lines 4, Hallmark);

However, Hallmark did not specifically detail the step of depicting and display in the parallel execution steps. On the other hand, MacLeod disclose: display the steps of the query execution plan in a graphical user interface (e.g., col. 8, lines 7-49, Fig.(s), 5-9, MacLeod), depicting parallel execution of steps of the query execution plain in the graphic user interface (e.g., col. 8, lines 29-49, Fig. 6, MacLeod). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art, to include the steps for displaying the claimed query execution plan in Hallmark's system as taught by MacLeod. The motivation is to provide a user with a GUI of multiple query execution plans, such that the user can select, compare and optimizing a query in the massively parallel execution system.

In addition, Hallmark/Macleod disclose: wherein depicting the parallel execution of steps comprises displaying plural elements corresponding to concurrently executing plural steps on respective processors of the parallel database system (e.g., Fig. 7, col. 9, lines 5-13, MacLeod; col. 6, lines 23-54, Hallmark).

As per claim 2, the limitations of this claim have been noted in the rejection of claim 1 above. In addition, Hallmark/ MacLeod disclose:. wherein determining the steps comprises determining steps of the query execution plan in the parallel database system running in a multi-processing platform having plural nodes (col. 6, lines 3 I -45, Hallmark).

Regarding claim 3, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim I above. In addition, Hallmark/ MacLeod discloses: Wherein determining the steps comprises determining steps of the query execution plan in the parallel database system running in a platform having plural virtual processors to handle access to data in the parallel database system (co. 7, lines 1-19, Hallmark).

Regarding claim 4, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition, Hallmark/ MacLeod disclose: displaying the steps as icons (211, Fig. 6 and corresponding text, MacLeod.).

As per claim 5, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition, Hallmark/MacLeod discloses: wherein the database management system is executable in a platform (see window 200, Fig. 6, and corresponding text, MacLeod); wherein displaying the icons comprises display one or more of the icons selected from the group consisting of an icon representing a table (col. 8, lines 7-27, MacLeod), an icon representing an operation performed on a component of the platform (col. 8, lines 7-27, MacLeod), an icon representing a query statement (col. 7, lines 49-56, MacLeod), icon representing an operation performed on two or more tables (col. 8, lines 7-48, MacLeod).

As per claims 6 and 31, the limitations of these claims have been noted in the rejection of claims 1 and 30, respectively. In addition, Hallmark/MacLeocl discloses the steps of the query execution plain is performed by an optimizer (col. 8, lines 38-45, Hallmark).

As per claim 9, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition, Carino/MacLeod disclose displaying explain text of the query execution plan (col. 6, lines 55-61, MacLeod).

Regarding claim 10, the limitations of this claim have been noted in the rejection of claim 9. Applicant's attention is directed to the rejection of claim 9 above. In addition, Hallmark/MacLeod disclose: wherein the explain text comprises displaying the explain text in a first screen and wherein displaying the steps of the query execution plan comprises displaying the steps in a second screen (Fig. 5 and corresponding text, MacLeod).

Regarding claim 11, Hallmark/MaCLeod disclose: a method of testing performance of a query, comprising:

Determining a first execution plan of the query under a first condition and a second execution plan of the query under a second condition (e.g., Fig. 6, MacLeod, col. 6, lines 11 -54,

Hallmark); display the first and second execution plans concurrently to enable comparison of the execution plans (e.g., Fig(s). 6-7 and corresponding text, MacLeod).

Regarding claim 12, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 1 I above. In addition, Hallmark/MacLeod disclose: wherein displaying the first and second execution plans comprises displaying the execution plans in a graphical user interface (Fig. 5 and Fig. 6 and corresponding text, MacLeod).

Regarding claim 13, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the .rejection of claim I 1 above. Hallmark/MacLeod disclose: wherein displaying the first and second execution plans comprises displaying the execution plans in a graphical user interface having a first screen to display the first execution plan and a second screen to display the second execution plan (Fig. 5 and Fig. 6 and corresponding text, MacLeod).

As per claim 14, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 11 above. In addition, Hallmark/MacLeod disclose: displaying the first and second execution plans comprises

displaying a collection of icons to represent steps of each of the execution plans (col. 7, lines 49 to col. 8, lines 51, MacLeod).

As per claim 15, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the :rejection of claim. 11 above. In addition, Hallmark/MacLeod discloses: a third execution plan of the query under a third condition (col. 8, lines 57 to col. 9, lines 5, Hallmark) and displaying the first, second and third execution plans concurrently to enable comparison of the execution plans (Fig. 9 and corresponding text, MacLeod).

Regarding claims 16-17, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 11 above. In addition, Hallmark/MacLeod discloses: wherein determining the first execution plan comprises determining an execution plan for the query in cooperation with a first version of a software module of a parallel database system (col. 16, lines 32-42, Hallmark); wherein determining the second execution plan comprises determining an execution plan for the query in cooperation with a second version of a software module of a parallel database system (col. 16, lines 43-52, Hallmark);

Regarding claims 18-19, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 11 above. In addition, Hallmark/MacLeod discloses: wherein determining the first. execution plan comprises determining an execution plan for the query in the system having a first arrangement and the second execution plan comprises determining an execution plan for the query in a system having a second arrangement (see col. 16, lines 53-61, Hallmark).

Regarding claim 20, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 11 above. In addition, Hallmark/MacLeod disclose: wherein determining the first execution plan comprises determining execution plan involving a table having a first content" (e.g., Fig. 7, MacLeod; col. 16, lines 53-61, Hallmark).

Regarding claim 21-22, the limitations of this claim have been noted in the rejection of claim 11. Applicant's attention is directed to the rejection of claim 11 above. In addition, Hallmark/MacLeod disclose: wherein determining a second content contains statistics (e.g. Fig. 6, MacLeod; col. 17, lines 16-23, Hallmark).

Regarding claim 34, the limitations of this claim have been noted in the rejection of claim 30. In addition, Hallmark/MacLeod disclose: further determine a second execution plan of the query for the parallel database system (col. 8, lines 57 to col. 9, lines.5, Hallmark); display the step of the second execution plan concurrently with the steps of the first execution plan in the graphical user interface (Fig. 5 and Fig. 6 and corresponding text, MacLeod).

Regarding claim 37, the limitations of this claim have been noted in the rejection of claim 1 1. In addition, Hallmark/MacLeod disclose: wherein determining the first and second execution plans comprises determining the first and second execution plans in parallel database system environment (col. 6, liens 22-54, Hallmark); and displaying each of the first and second execution plans comprises displaying plural elements corresponding to concurrently executing plural steps on respective processors of the parallel database system environment (Fig. 5 and 6, and corresponding text, MacLeod).

Regarding claims 35, 38 and 40, the limitations of these claims have been noted in the rejection of claims 1, 37 and 30 above, respectively. In addition, Hallmark/MacLeod disclose: wherein display the plural elements comprises displaying the plural elements side-by-side to indicate concurrent execution of the respective steps (col. 7, lines 49-61, MacLeod).

Regarding claims 36, 39 and 41, the limitations of these claims have been noted in the rejection of claims 35, 38 and 40 above, respectively. In addition, Hallmark/MacLeod disclose: further comprising displaying other elements in sequence with the plural side-by-side elements to indicate sequential execution of other steps corresponding to the other elements (col. 7, lines 49-61, MacLeod).

Claim Rejections - 35 USC § 103 (Continue)

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over MacLeod et al. (U.S 6434545) (MacLeod) in view of Reiner et al. (U.S 6289334) (Reiner).

Regarding claim 23, MacLeod disclose: a graphic user interface (47, Fig. 1 and corresponding text, MacLeod); the controller to displaying a representation of the execution plan in the graphical user interface (23, Fig. 1 and corresponding text, MacLeod). However, MacLeod didn't disclose: a parallel database system; a controller to determine an execution plan of a query based on emulation data that emulates an environment of a target system. On the other hand, Reiner disclose: in which a parallel database system is implemented (col. 30, lines 13-30, Reiner); a controller to determine an execution plan of a. query based on emulation data that emulates an environment of a target system (col. 31, lines 1-67, Reiner). Thus, at the time

invention was made, it would have been obvious to a person of ordinary skill in the art to include a controller to determine an execution plan of a query based on emulation data that emulates an environment in the system of MacLeod as taught by Reiner. The motivation being to enable to imitate the system can run on the other system environment as well.

Claims 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacLeod et al. (U.S 6434545) (MacLeod) in view of Reiner et al. (U.S 6289334) (Reiner) and further in view of Carino Jr (U.S 6067542).

Regarding claim 24, the limitations of this claim have been noted in the rejection of claim 23. Applicant's attention is directed to the rejection of claim 23 above. However, MacLeod/Reiner didn't discloses: wherein the emulation data comprises cost-related information including a number of nodes in the target system and number of CPUs in each node. On the other hand, Carino disclose: wherein the emulation data comprises cost-related information including a number of nodes in the target system and number of CPUs in each node (see Fig. 4 and corresponding text, Carino Jr.). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include the emulation data comprises cost-related information including a number of nodes in the target system and number of CPUs in each node. On the other hand, Carino disclose: wherein the emulation data comprises cost-related

information including a number of nodes in the target system and number of CPUs in each node in the combination system of MacLeod/Reiner as taught by Carino. The motivation being to enable to optimize the costs to generate a query plan.

Regarding claim 25, the limitations of this claim have been noted in the rejection of claim 23. Applicant's attention is directed to the rejection of claim 23 above. In addition, MacLeod/Refiner/Carino discloses: wherein the emulation data comprises cost-related information including a number of virtual processors running in the target system (col. 13, lines 40-64, Carino Jr.).

Regarding claim 26, the limitations of this claim have been noted in the rejection of claim 23. Applicant's attention is directed to the rejection of claim 23 above. In addition, In addition, MacLeod/Refiner/Carino discloses: " wherein the emulation data comprises cost-related information relating to costs of doing operations in the target system (see col. 14, lines 61-65, Carino Jr.).

Regarding claim 27, the limitations of this claim have been noted in the rejection of' claim 23. Applicant's attention is directed to the rejection of claim 23 above. In addition, In

addition, MacLeod/Refiner/Carino discloses: wherein the emulation data represents a target system having a multi-node parallel processing system (see col. 9, lines 7 -14, Carino, Jr.).

Regarding claim 29, the limitations of this claim have been noted in the rejection of~claim 23. Applicant's attention is directed to the rejection of claim 23 above. In addition, In addition, MacLeod/Refiner/Carino discloses: wherein the emulation data represents a target system running plural virtual processors for handling access to the parallel database system (see Fig. 4 and corresponding text, Carino, Jr.).

Claims 7, 8, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hallmark et al. (U.S 5857180) (Hallmark) in view of MacLeod et al. (6434545) (MacLeod) and further in view of Reiner et al. (U.S 6289334) (Reiner).

As per claim 7, the limitations of this claim have been noted in the rejection of claim 6. Applicant's attention is directed to the rejection of claims 6 above. However, Hallmark/MacLeod didn't disclose: the steps of the query execution plain is performed by the optimizer based on emulated environment data of a target system, emulated environment data present in a test system, the target system comprising the parallel database system. On the other hand, Reiner disclose: wherein determining the steps of the query execution plain is performed by an optimizer

based on emulated environment data of a target system, emulated environment data present in a test system, the target system comprising the parallel database system (col. 31, lines 1-14, Reiner). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include the steps of the query execution plain is performed by an optimizer based on emulated environment data of a target system, emulated environment data present in a test system in the combination system of Hallmark/MacLeod as taught by Reiner. The motivation being to enable to imitate the system carp run on the other system environment as well.

As per claim 8, the limitations of this claim have been noted in the rejection of claim 1. In addition, Hallmark/MacLeod/Reiner discloses: the steps of the query execution plain is performed in a test system based on emulated environment data of a target system that is separate from the test system (col. 31, lines 55-67, Reiner), the target system comprising the parallel database system (col. 31, lines 24-39, Reiner).

Regarding claim 32, the limitations of this claim have been noted in the rejection of, claim 30. In addition, Hal Imark/MaCLcod/Refiner discloses: wherein the instructions when executed cause the controller to receive environment information to emulate a target database system (col. 34, lines 30-42, Reiner).

Regarding claim 33, the limitations of this claim have been noted in the rejection of claim 32. In addition, Hallmark/MacLeod/Refiner discloses: wherein the instructions when executed cause the controller to determine the execution plan of the query based on the environment information (col. 35, lines 54-60, Reiner).

Response to Arguments

Applicant's arguments filed on 07/28/2003 have been fully considered but they are not persuasive.

The examiner disagrees with applicant's assertion that the prior art on record including Hallmark and MacLeod fail to teach or suggest the claimed features: 1) "depicting parallel execution steps of a query execution plan in a graphical user interface"; 2) "there is no suggestion or motivation to combine Hallmark and Macleod."

In response to these arguments, the examiner points out that Hallmark specifically depict a database system which can create an optimal query plan and execute the plan parallel based on a data flow operators (DFOs) tree structure. [e.g. see Abstract, lines 1-19; col. 8, line 64 - col. 9, line 4, Fig. 5, etc]. Although Hallmark did not expressively disclose a GUI for displaying the parallel execution plan, however, MacLeod specifically teaches a GUI to display the parallel query execution plan in form of tree structure [e.g., col. 8, lines 7-12; col. 8, line 60 - col. 9, line

4; Fig(s) 5-9]. MacLeod further discloses that each icon of the tree identifying the single operation (or execution step) in the execution plan [see col. 8, lines 7- 11]. Thus, with the teachings of Hallmark and MacLeod in front of him/her, it would have been obvious to an ordinary skill person in the art, to apply the GUI technique taught by MacLeod into Hallmark's parallel query plan execution system, because by doing so, the combined system would provide a GUI to display the parallel execution steps of a query execution plan, such that the end use can use the GUI to monitor, compare, select and create most efficient query execution plan as desired [e.g. see Fig. 4, MacLeod]. Based on the discussion above, Hallmark and MacLeod not only disclose the features as claimed by applicant, but also teach the benefits of having a GUI interface in a concurrent query plan executing system [e.g., col. 10, lines 2-6]. These teachings are definitely strong enough to motivate an ordinary skill person in the art to implement a user friendly and optimizable query plan processing system as claimed by applicant.

The examiner further disagrees with applicant's argument that the prior art including MacLeod and Reiner fail to disclose the claimed feature recited in claim 23 -- " determining an execution plan of a query based on emulation data that emulates an environment of a target system in which a parallel data base system is implemented".

In response to this argument, the examiner first clearly points out that MacLeod did not describe any set or routines (PUPI) to emulates the calling sequence and behavior of UPI routines

as recited by applicant in page 11, bottom paragraph of the amendment filed on 07/28/2003. Furthermore, the examiner notices that Reiner expressively disclosed the feature cited in claim 23. For example, see Fig(s). 11-12, col. 31, lines 1-39, wherein Reiner specifically teaches a Parallel ORACLE Program Interface (POPI) library developed by KSR (Kendall Square Research) to emulate client behavior [e.g., to move the Query Decomposition (QD) code into server-side, col. 31, lines 24-26] into an environment of a target (or server) system in which a parallel data base system is implemented. Reiner further points out that the POPI routines would determining an execution plan of a query based on emulation data [e.g., the process to identify whether a particular call from the client required parallel processing or not and emulate the behave as a client with respect to additional servers to which they would connect from parallel threads to process parallel subquiries, see col. 31, lines 30-39].

Thus, based on the above discussion, the examiner maintain the same rejections.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Chen, whose telephone number is (703) 308-1155. The examiner can normally be reached Monday through Friday from 7:30 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic, can be reached at (703) 308-1436. The fax phone numbers for this group is (703) 872-9306.

Susan Chen

Oct. 9, 2003

UYEN LE
PRIMARY EXAMINER
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